Asset pricing on earnings announcement days (202206)

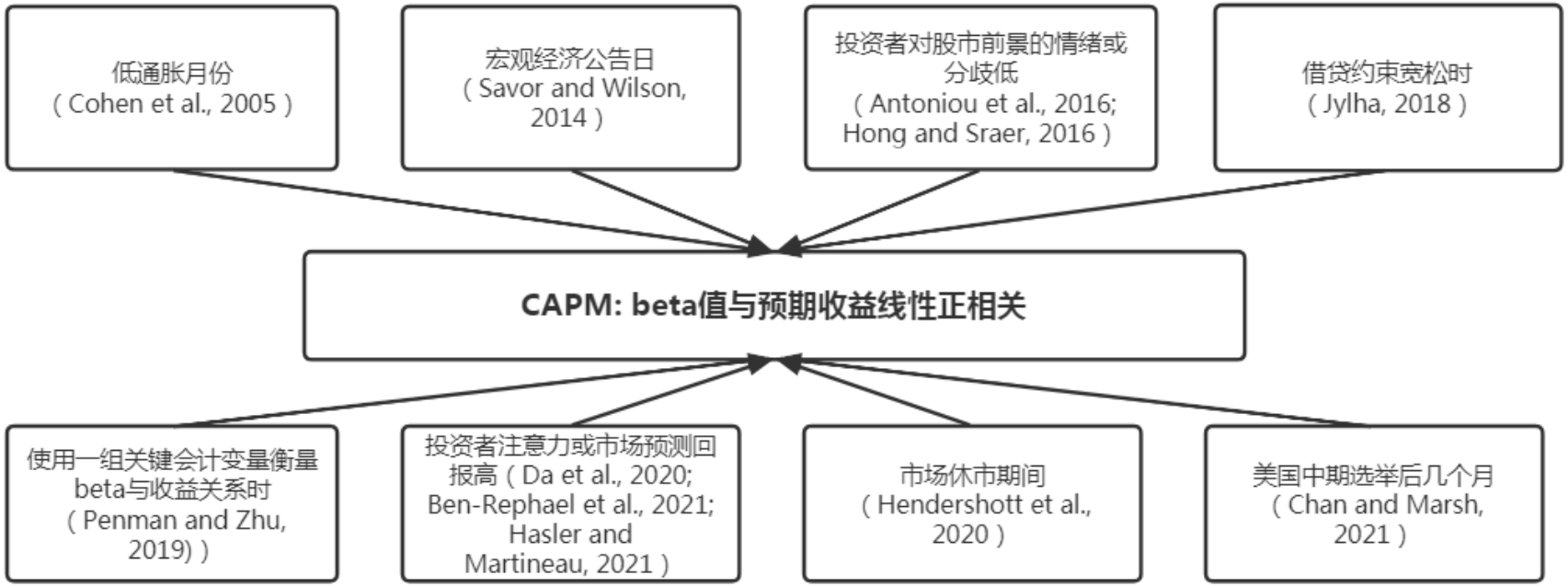
Reporter: Wen Zuojun

September 2022

Contents

1. 研究背景
2. 主要发现
3. 数据和模型
4. 实证结果
5. 解释
6. 结论

1. 研究背景


低通胀月份
(Cohen et al., 2005)
宏观经济公告日
(Savor and Wilson, 2014)
投资者对股市前景的情绪或分歧低
(Antoniou et al., 2016; Hong and Sraer, 2016)
借贷约束宽松时
(Jylha, 2018)
CAPM: beta值与预期收益线性正相关
使用一组关键会计变量衡量beta与收益关系时
(Penman and Zhu, 2019))
投资者注意力或市场预测回报高 (Da et al., 2020; Ben-Rephael et al., 2021; Hasler and Martineau, 2021)
市场休市期间
(Hendershott et al., 2020)
美国中期选举后几个月
(Chan and Marsh, 2021)

2. 主要发现

- 当有影响力的S&P 500中公司在季报早期（leading earnings announcement days-LEADs）披露公司收益新闻时，市场贝塔与收益的关系是线性的，且显著正相关。检验各种投资组合、个股和国债后，都支持这一结果。
- 在除lead以外的日子(即“其他日子”或非LEADs)，市场贝塔-收益关系是平坦的。
- 大公司发布的早期收益公告显著影响了资产定价。

3. 数据和模型

数据与LEADs定义

- 2001年1月至2019年12月期间标准普尔500指数所有成分股的季度盈余公告，共计4227个交易日。剔除了在周六、日和公共假日记录的收益新闻，共计35,826份盈余公告。（来自I/B/E/S-机构经纪人评估系统）
- 2001年1月至2019年12月期间纳斯达克交易的股票，包括所有CRSP股票代码为10或11的普通股票。（来自CRSP）
- 确定LEADs：选择在报告季度q第一周中的周二到周四，这三天至少有50个报告。（周一很少披露盈余新闻，且影响力较小；周五一般投资者注意力不集中且包含周末前特质）

3. 数据和模型

Table 1

Descriptive statistics of S&P 500 announcers.

This table reports descriptive statistics for S&P 500 announcers on LEADs and other days. Panel A reports the daily distribution of announcers, and Panel B reports the number of announcers each day between Monday and Friday. In Panel C, *Unique firms* is the number of announcers reporting in a given year, and *Mkt cap*, *B/M* and *# of analysts* report the respective cross-section median of market capitalization, firms' book-to-market ratios and number of analysts followings (all measured one quarter before the announcement date). The sample period covers January 2001 through December 2019.

Panel A: Daily distribution of announcers			Panel B: # of announcers in different weekdays		
	LEADs	Other days		LEADs	Other days
Mean	31	8	Monday	–	1719
Min	6	1	Tuesday	1534	5767
5 pctl	13	1	Wednesday	2123	6538
25 pctl	22	2	Thursday	3481	8387
50 pctl	29	4	Friday	–	6277
75 pctl	40	9			
95 pctl	59	32	Total	7138	28,688
Max	73	70			

3. 数据和模型

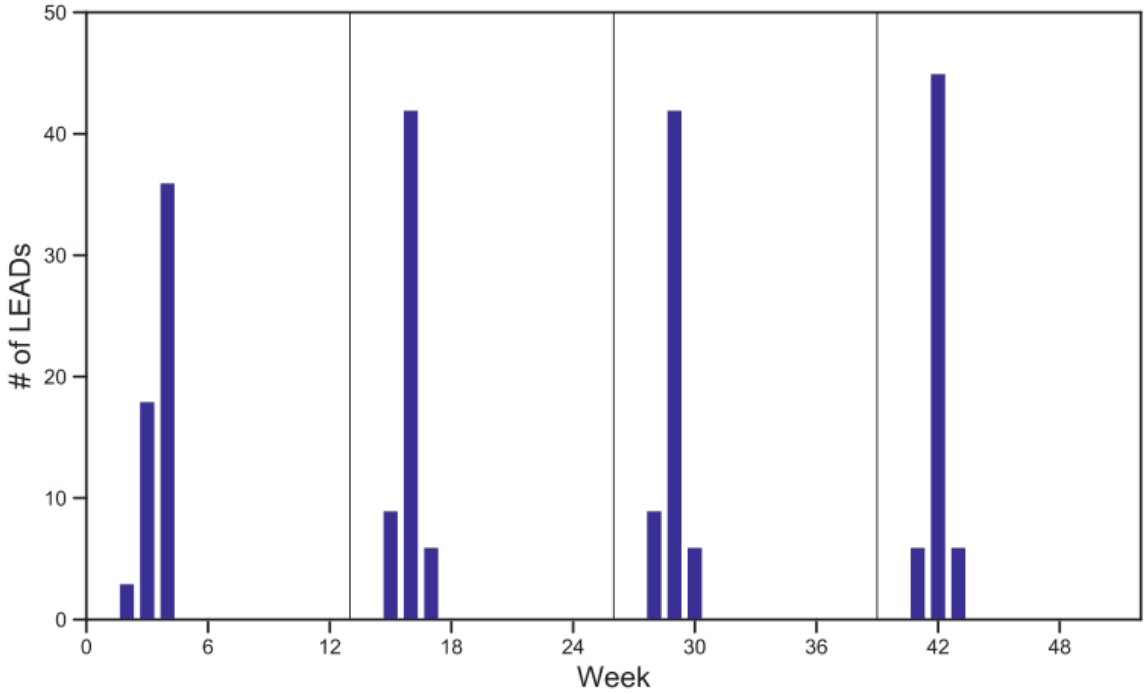


Fig. 2. LEADs in each quarter. In this figure, a typical year is equally partitioned into four fiscal quarters, each with 13 weeks. The number of days identified as LEADs are reported for each week-quarter. Since each quarter has three LEADs (Tuesday, Wednesday and Thursday), we have a total of 57 LEADs for each quarter over the 2001–2019 sample period (19 years).

3. 数据和模型

模型

- Fama-MacBeth regressions:

$$xr^{O}_{i,t+1} = a^{O} + b^{O}\beta_{i,t} + \varepsilon^{O}_{i,t+1} \quad (1)$$

$$xr^{L}_{i,t+1} = a^{L} + b^{L}\beta_{i,t} + \varepsilon^{L}_{i,t+1} \quad (2)$$

- Panel regression:

$$xr_{i,t+1} = a + b_1\beta_{i,t} + b_2 D^{LEAD}_{t+1} + b_3\beta_{i,t} \times D^{LEAD}_{t+1} + \varepsilon_{i,t+1} \quad (3)$$

4. 实证结果

Beta portfolios

Procedures:
1. we estimate monthly market beta for all A-share stocks using a 12-month rolling window of daily full-day returns from 2001 to 2019.
2. All stocks are sorted into 10 groups according to beta size and the portfolio is adjusted once a month.
3. Portfolio returns are calculated as weighted average averages.

For figure:
Estimating unconditional full-sample beta using full-sample daily full-day returns

For table:
Estimating time-varying monthly beta using daily full-day returns over a rolling 12-month window

4. 实证结果

Beta portfolios

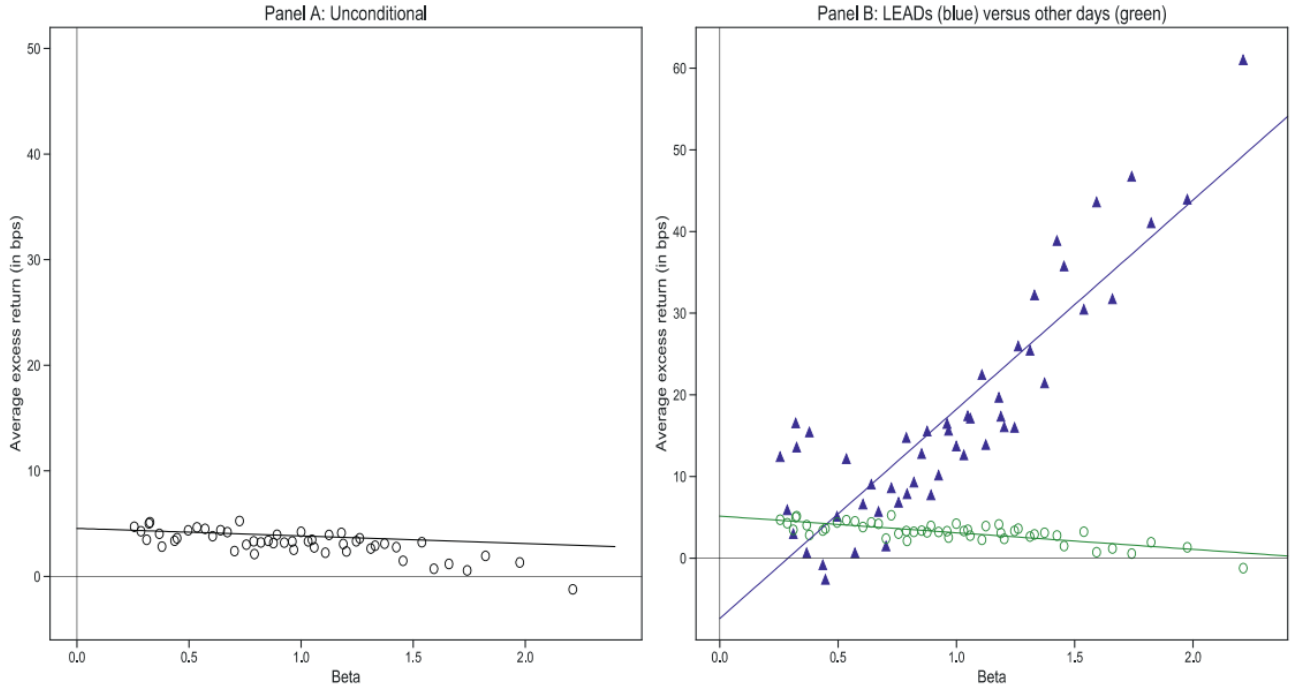


Fig. 3. Average excess returns for 50 beta-sorted portfolios. The figure plots the average daily excess stock returns (expressed in basis points) against market betas for 50 value-weighted, beta-sorted portfolios. Panel A plots the unconditional SML, and Panel B plots the conditional SMLs on LEADs (blue) and on other days (green). For each test portfolio, we use the same full-sample beta estimate for both types of day, and we superimpose an ordinary least squares best fitted line for each type of day. The sample period covers January 2001 through December 2019. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

4. 实证结果

Table 2

Fama-MacBeth and panel regression results for various test portfolios.

This table reports the results from Fama-MacBeth and panel regressions of daily excess returns (expressed in basis points) on market betas for various test portfolios. The betas used to construct the portfolios are estimated using a 12-month rolling regression on daily excess returns. Panels A and B report the results for beta decile portfolios (value-weighted portfolios for Panel A and equal-weighted portfolios for Panel B). Panel C reports the results for 10 beta-sorted portfolios, 25 Fama and French size- and book-to-market sorted portfolios and 17 industry-sorted portfolios; all are value-weighted. The parenthesized *t*-statistics are estimated based on standard errors calculated using standard deviations of the time-series coefficient estimates (for the Fama-MacBeth regression) and standard errors clustered by days (for the panel regression). The sample period covers January 2001 through December 2019. *, ** and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: 10 beta-sorted portfolios (value weighted)

	Fama-MacBeth			Pooled regression				
Type of day	Intercept	β	Avg R^2	Intercept	B	D^{LEAD}	β x D^{LEAD}	R^2
LEADs	−2.62	22.24**	0.50	4.64***	−1.58	−11.31	27.35***	0.001
	(−0.50)	(2.23)		(3.48)	(−0.78)	(−1.59)	(2.63)	
Other days	4.46***	−1.60	0.51					
	(4.17)	(−0.77)						
LEADs - Other	−7.08	23.84**						
	(−1.44)	(2.50)						

4. 实证结果

Panel B: 10 beta-sorted portfolios (equal weighted)

	Fama-MacBeth			Pooled regression				
Type of day	Intercept	β	Avg R^2	Intercept	β	D^{LEAD}	β x D^{LEAD}	R^2
LEADs	7.88**	13.12	0.64	9.29***	−3.96**	−4.50	19.50**	0.001
	(2.48)	(1.39)		(8.19)	(−2.28)	(−0.82)	(2.50)	
Other days	8.37***	−3.27	0.61					
	(10.50)	(−1.58)						
LEADs - Other	0.49	16.39*						
	(0.13)	(1.73)						

Panel C: 10 beta-sorted + 25 size/BM sorted + 17 industry portfolios

	Fama-MacBeth			Pooled regression				
Type of day	Intercept	β	Avg R^2	Intercept	B	D^{LEAD}	β x D^{LEAD}	R^2
LEADs	−3.37	20.31**	0.21	2.98	0.09	−12.11	24.94***	0.001
	(−0.64)	(2.07)		(1.43)	(0.05)	(−1.23)	(2.58)	
Other days	4.38***	−1.44	0.23					
	(3.73)	(−0.70)						
LEADs - Other	−7.75	21.75**						
	(−1.44)	(2.29)						

4. 实证结果

Beta, size, book-to-market ratio and industry portfolios

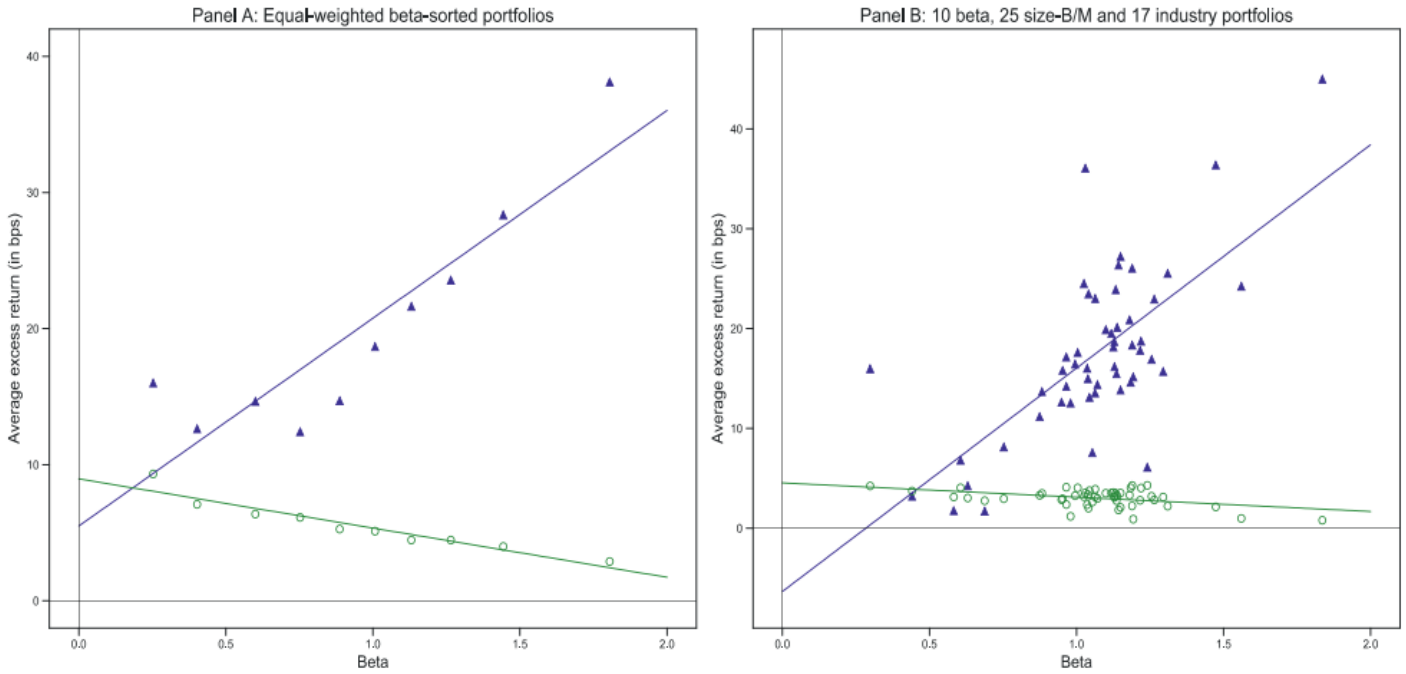


Fig. 4. Average excess returns for different test portfolios. Panel A plots the average daily excess returns (expressed in basis points) against market betas for 10 equal-weighted beta-sorted portfolios. Panel B presents analogous plots for 10 beta-sorted portfolios, 25 Fama and French size- and book-to-market sorted portfolios and 17 industry-sorted portfolios (all are value-weighted). In each panel, we plot the conditional SMLs on LEADs (blue) and on other days (green). For each test portfolio, we use the same full-sample beta estimate for both types of day, and we superimpose an ordinary least squares best fitted line for each type of day. The sample period covers January 2001 through December 2019. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

4. 实证结果

Treasuries

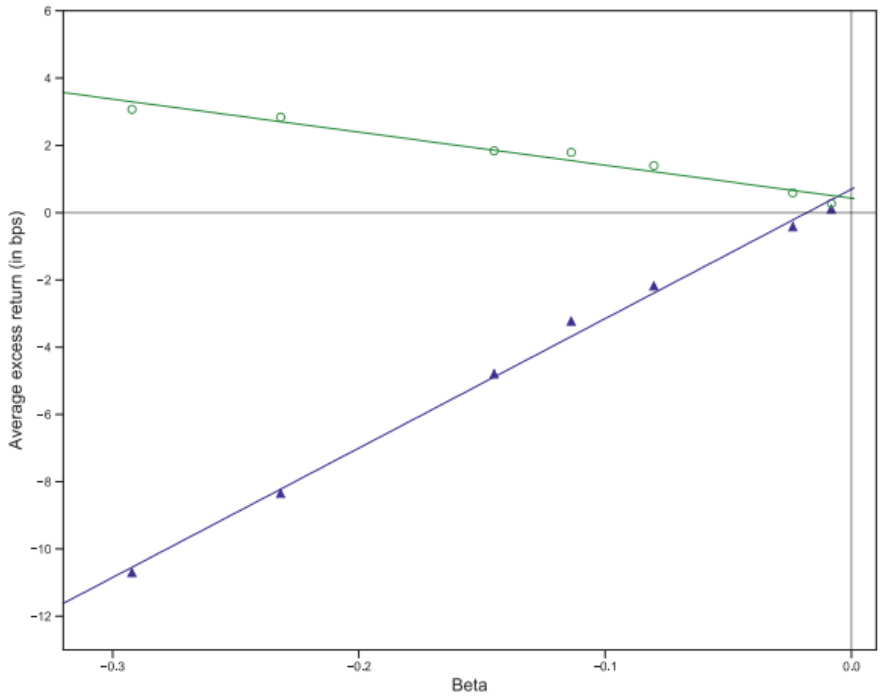


Fig. 5. Average excess returns for Treasuries. This figure plots the average daily excess returns (expressed in basis points) against market betas for US Treasuries with different maturities. The conditional LEAD-SMLs is in blue, and the other day-SML is in green. For each test portfolio, we use the same full-sample beta estimate for both types of day, and we superimpose an ordinary least squares best fitted line for each type of day. Constrained by data availability, the sample period used in the analysis covers January 2001 through December 2017. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

4. 实证结果

Market premiums and trading strategies

- 本文评估了三种交易策略的表现：
- (1)投资LEADs的总市场投资组合，其他日子投资无风险资 产；
- (2)投资无风险资产，其他日子投资市场投资组合；
- (3)在 2001年至2019年期间购买并持有市场投资组合。

- 另外，还评估了两种有关beta的策略：
- （1）反向押注beta策略：在整个样本期间对低（高）十分位beta组合持有多头（空头）头寸
- （2）混合的押注beta策略：在LEADs对高（低）十分之一分类投资组合上持有多头（空头）头寸，并在其他日子选择反向押注beta策略。

Panel A: Market risk premium			
	LEADs	Other days	All days
Average (bps)	15.86	2.17	2.82

Panel B: Cumulative log excess returns			
	LEADs	Other days	All days
Cumulative returns	0.346	0.677	1.023

Panel C: Investing in the aggregatedmarket portfolio			
	(i)	(ii)	(iii)
Average (%)	0.013	0.026	0.034
Std deviation (%)	0.253	1.141	1.169
Sharpe Ratio	0.052	0.023	0.029

Panel D: Investing in long-short portfolio (not beta neutral)		
	Hybrid	Betting against beta
Average (%)	0.044	0.016
Std deviation (%)	2.284	2.284
Sharpe Ratio	0.019	0.007

Panel E: Investing in long-short portfolio (beta neutral)		
	Hybrid	Betting against beta
Average (%)	0.102	0.128
Std deviation (%)	2.375	2.375
Sharpe Ratio	0.043	0.054

4. 实证结果

- **Additional tests-Realized betas**

- 第一个担心：使用12个月滚动回归估计的beta是否明智？
- 检验方法：
- (1)使用日内高频数据（上午9：45到下 午4点之间每25 min的股票价格，隔夜收益）；
- (2)使用标准普尔500的所有成分股票（2001-2019）；
- (3)估计公式：

$$R\beta_{j,t} = \frac{\sum_{k=1}^{16} r_{j,t,k} r_{m,t,k}}{\sum_{k=1}^{16} r_{m,t,k}^2} \quad (4)$$

4. 实证结果

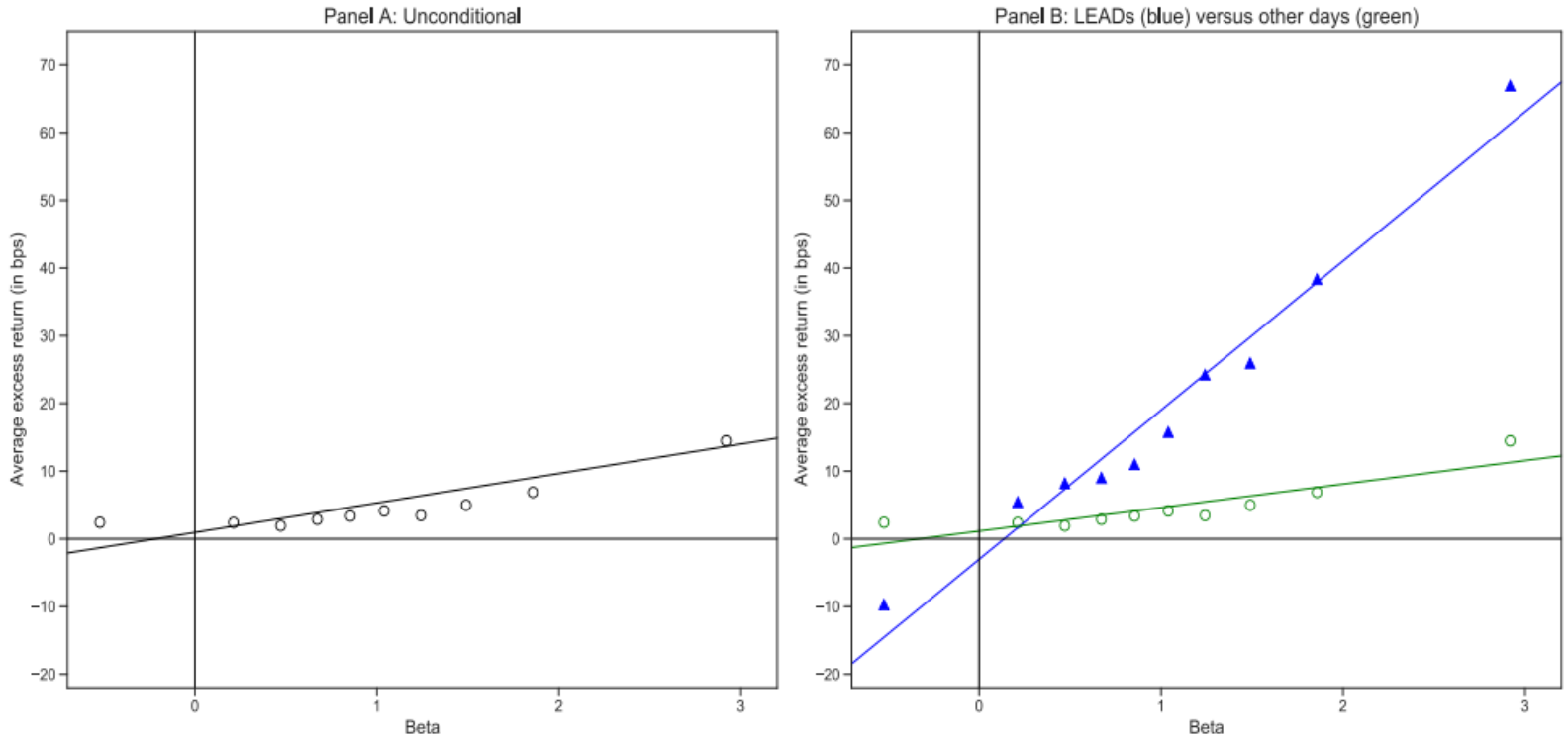


Fig. 6. Average excess returns for realized beta-sorted portfolios. This figure plots the average daily excess returns (expressed in basis points) against market betas for 10 value-weighted portfolios sorted on realized betas estimated using Eq. (4). Panel A plots the unconditional SML, and Panel B plots the conditional SMLs on LEADs (blue) and on other days (green). For each test portfolio, we use the same full-sample beta estimate for both types of day, and we superimpose an ordinary least squares best fitted line for each type of day. The sample period covers January 2001 through December 2019. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

4. 实证结果

Additional tests

Table 4

Fama-MacBeth and panel regression results for realized beta-sorted portfolios.

This table reports the results from Fama-MacBeth and panel regressions of daily excess returns (expressed in basis points) on market betas for 10 value-weighted portfolios sorted based on realized betas. We form portfolios for each trading day, with stocks sorted according to realized beta estimated on a daily basis using Eq. (4). The parenthesized *t*-statistics are estimated based on standard errors calculated using standard deviations of the time-series coefficient estimates (for the Fama-MacBeth regression) and standard errors clustered by days (for the panel regression). The sample period covers January 2001 through December 2019. *, ** and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	Fama-MacBeth			Pooled regression				
Type of day	Intercept	β	Avg R^2	Intercept	β	D^{LEAD}	β x D^{LEAD}	R^2
LEADs	−4.26	23.45**	0.61	3.15**	1.59	0.69	14.20**	0.001
	(−0.66)	(2.39)		(2.18)	(1.47)	(0.11)	(2.21)	
Other days	−1.18	5.86***	0.52					
	(−0.99)	(2.98)						
LEADs - Other	−3.08	17.59*						
	(−0.55)	(1.76)						

4. 实证结果

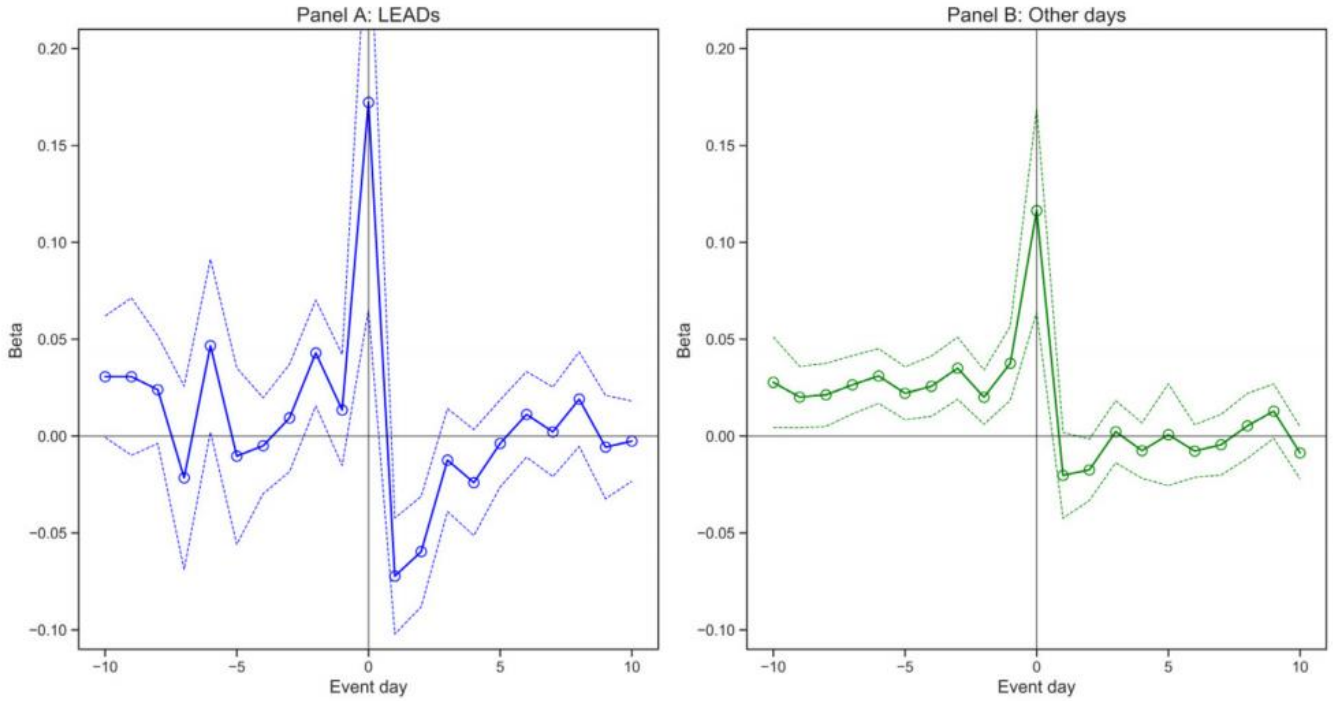


Fig. 7. Changes in realized beta around earnings news days. The figure plots the estimated changes in realized betas over the [−10, +10] event window when earnings news is released on LEADs (Panel A) and on other days (Panel B). Point estimates are marked with a solid line, and 95% confidence intervals (calculated from standard errors that clustered using two-way firm-year technique of Petersen (2009)) are plotted with dotted lines. To facilitate comparison, both panels have the same y-scale. The sample period covers 2001 through 2019. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

$$R\beta_{i,t} = \alpha_i + \delta_t + \gamma^L_{-10} D^L_{i,t+10} + \cdots + \gamma^L_0 D^L_{i,t} + \cdots + \gamma^L_{10} D^L_{i,t-10}$$
$$\gamma^O_{-10} D^O_{i,t+10} + \cdots + \gamma^O_0 D^O_{i,t} + \cdots + \gamma^O_{10} D^O_{i,t-10} + \varepsilon_{i,t}, \quad (5)$$

4. 实证结果

Overnight returns versus trading day returns

- Hendershott et al. (2020)：隔夜和日间的表现是否有所差异？

$$\left(1+r_{jt}^{close-to-close}\right)=\left(1+r_{jt}^{close-to-open}\right)\left(1+r_{jt}^{open-to-close}\right) \tag{6}$$

4. 实证结果

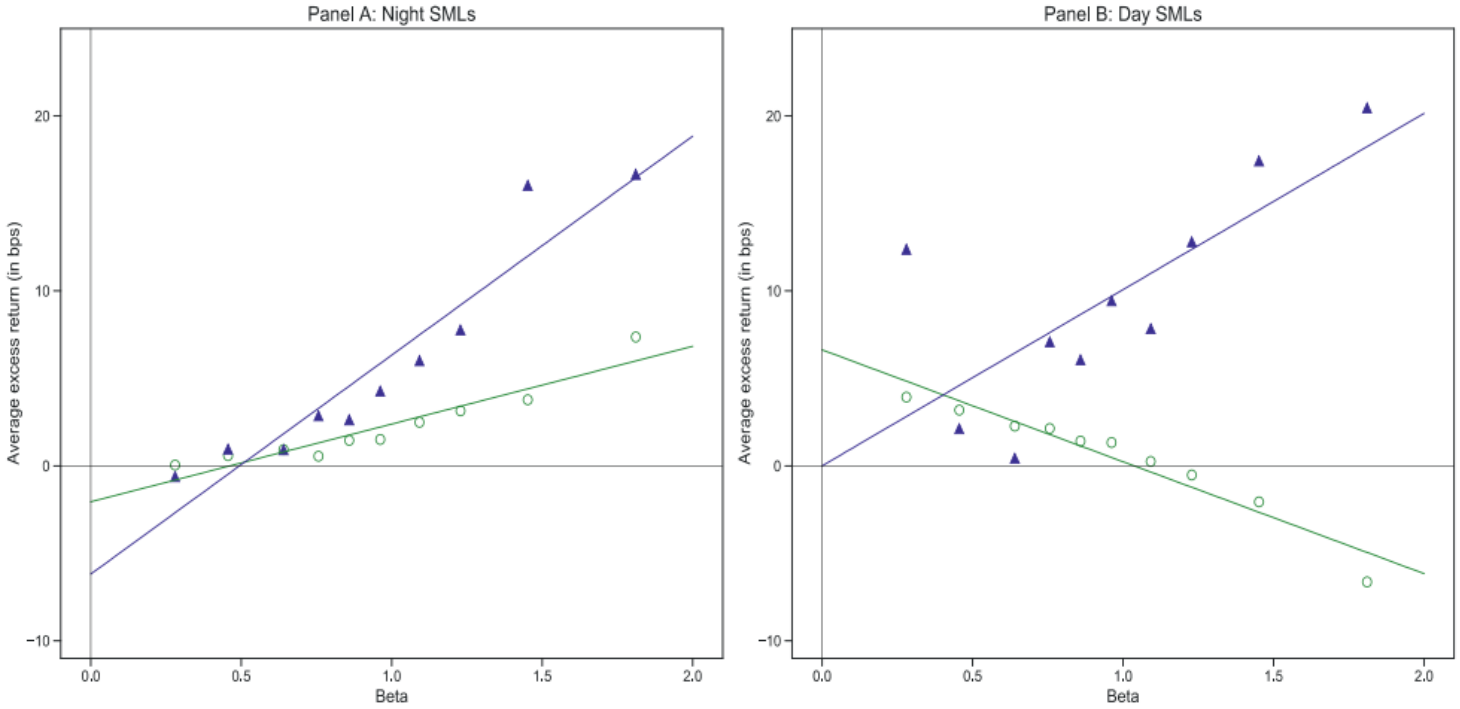


Fig. 8. Average excess returns for beta-sorted portfolios on day and overnight. Panel A plots the average daily excess returns estimated overnight (close-to-open) against market betas for 10 value-weighted beta-sorted portfolios, while Panel B presents the analogous plots for excess returns estimated during the day (open-to-close). In each panel, we compare the SMLs when earnings news is released on LEADs (blue) and on other days (green). We use the same full-sample beta estimate for all types of day, and we superimpose an ordinary least squares best fitted line for each type of day. The sample period covers January 2001 through December 2019. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

4. 实证结果

Table 5
Fama-MacBeth regression results for returns on day and night.
This table reports the results for Fama-MacBeth regressions of daily excess returns on market betas for 10 value-weighted beta-sorted portfolios on LEADs (Panel A) and on other days (Panel B). In each panel, we report the results for excess returns during the trading day and overnight. The parenthesized *t*-statistics are estimated based on standard errors calculated using standard deviations of the time-series coefficient estimates. The sample period covers January 2001 through December 2019. *, ** and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	Panel A: LEADs			Panel B: Other days		
Type of day	Intercept	β	Avg R^2	Intercept	β	Avg R^2
Overnight	−5.15*	12.31**	0.43	−2.42***	4.71***	0.51
	(−1.91)	(2.32)		(−5.67)	(4.53)	
Day	−0.96	10.80	0.51	6.39***	−6.11***	0.49
	(−0.20)	(1.21)		(6.53)	(−3.47)	
Overnight - Day	−4.18	1.51		−8.81***	10.82***	
	(−0.77)	(0.14)		(−8.26)	(5.30)	

4. 实证结果

- **Weekday and intraday returns**

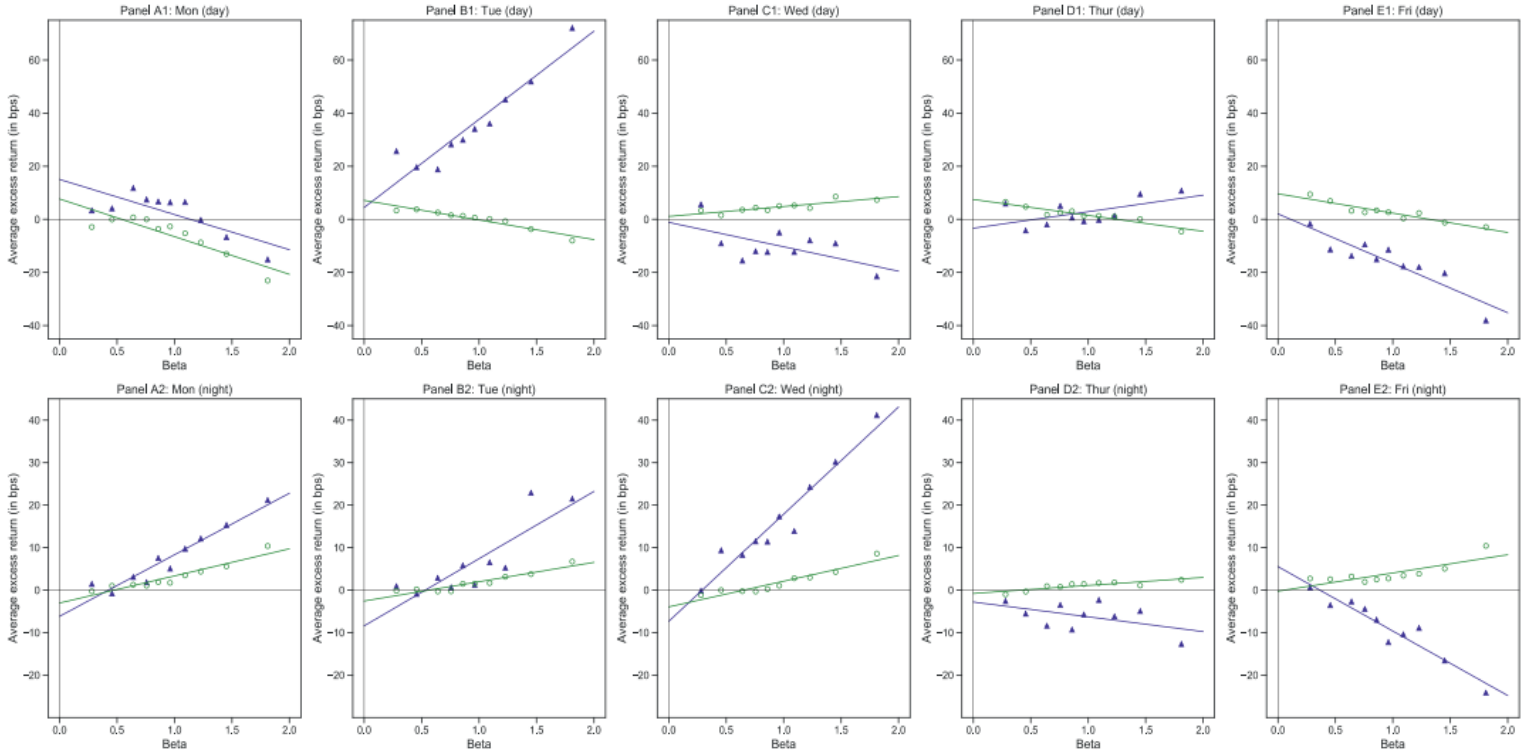


Fig. 9. Average day and night returns for beta-sorted portfolios on different weekdays. The top panels plot the average daytime returns against market betas for 10 value-weighted beta-sorted portfolios from Monday through Friday. The bottom panels present the analogous plots for average overnight returns. In each panel, we compare the SMLs when earnings news is released on LEADs (blue) and on other days (green). LEADs occur during midweek from Tuesday to Thursday, and the day- and night-SMLs presented in panels A1 and A2 (panels E1 and E2) are estimated on Monday prior to LEAD-Tuesday (on Friday following LEAD-Thursday). We use the same full-sample beta estimate for all types of day, and we superimpose an ordinary least squares best fitted line for each type of day. To facilitate comparison, the respective top (bottom) panels have the same y-scale. The sample period covers January 2001 through December 2019. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

4. 实证结果

- **Weekday and intraday returns**

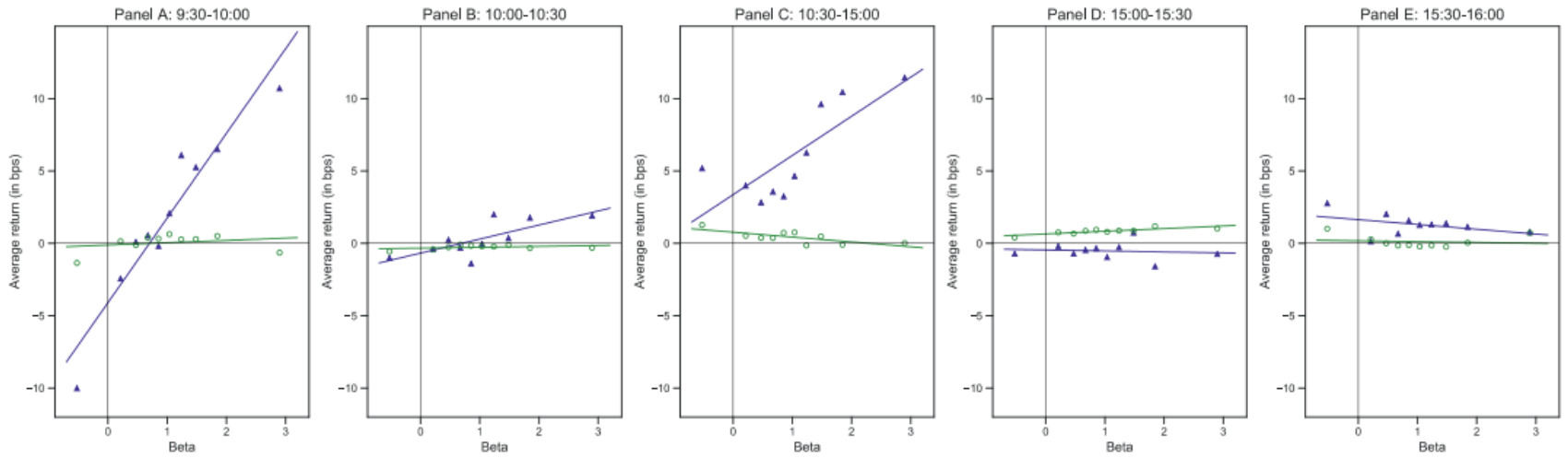


Fig. 10. Average intraday returns for realized beta-sorted portfolios. This figure plots the intraday average returns (expressed in basis points) against average realized betas for 10 value-weighted beta-sorted portfolios on LEADs (blue line) and on other days (green line). The panels show the SMLs for returns calculated for each 30-minute interval, except for Panel C which shows the SMLs estimated using aggregated returns between 10:30 and 15:00. We form portfolios every day, with stocks sorted according to realized beta estimated every day. For each plot, we use the same full-sample beta estimate for both types of day, and we superimpose an ordinary least squares best fitted line for each type of day. To facilitate comparison, all panels have the same y-scale. The sample period covers January 2001 through December 2019. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

- **Individual stocks**

Table 6
Fama-MacBeth and panel regression results for individual stocks.
This table reports the results from Fama-MacBeth and panel regressions of daily excess returns (expressed in basis points) for individual stocks. We require stocks to have a price per share of $2 and over. Panel A presents the regression results of daily excess returns on stock market betas only, and Panels B and C present the regression results after controlling for log market capitalization (Size), book-to-market ratios (BM) and cumulative returns over the past 12 months (PastRet). The parenthesized *t*-statistics are estimated based on standard errors calculated using standard deviations of the time-series coefficient estimates (for the Fama-MacBeth regression) and based on standard errors clustered by days (for the panel regression). The sample period covers January 2001 through December 2019. *, ** and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Beta only

	Fama-MacBeth			Pooled regression				
Type of day	Intercept	β	Avg R^2	Intercept	β	D^{LEAD}	β x D^{LEAD}	R^2
LEADs	0.13	23.27**	0.036	6.43***	0.54	−12.91	27.35***	0.001
	(0.03)	(2.57)		(3.32)	(0.27)	(−1.47)	(2.68)	
Other days	5.71***	1.60	0.040					
	(4.93)	(0.84)						
LEADs - Other	−5.58	21.67**						
	(−1.06)	(2.49)						

Panel B: With firm characteristics as controls (Fama-MacBeth regression)

Type of day	Intercept	β	Size	BM	PastRet (x100)	Avg R^2
LEADs	18.57	29.31***	−2.12**	25.64***	0.75***	0.068
	(0.94)	(3.19)	(−2.28)	(5.39)	(11.24)	
Other days	40.70***	7.80***	−2.64***	20.61***	0.63***	0.074
	(4.55)	(3.93)	(−5.72)	(16.84)	(40.04)	
LEADs - Other	−22.13	21.51**	0.52	5.03	0.12	
	(0.55)	(2.36)	(0.25)	(0.90)	(1.63)	

Panel C: With firm characteristics as controls (pooled regression)

Intercept	β	Size	BM	PastRet (x100)	D^{LEAD}	β x D^{LEAD}	R^2
28.61***	5.31***	−2.04***	22.36***	0.50***	−14.60*	28.50***	0.004
(3.20)	(2.62)	(−5.25)	(8.51)	(9.03)	(−1.67)	(2.77)	

4. 实证结果

- **Robustness tests**

- **（1）将样本按照周期划分为2001-2009和2010-2019两个子样本**

- **（2）重新定义LEADs：**
- **a. 季报中标准普尔500公司数量最高的一周内的连续工作日**
- **b. 季报中数量最高的非连续的5天**

- **结果：在LEADs，条件SML(1)基本平坦的，但(2)有一个正斜率，但并不显著，这表明市场beta并不能简单地“按计数密度”的盈余公告来解释平均收益。**

5. 解释

LEADers as attention-getters

- 使用了由Ben-Rephael等人开发的对机构投资者关注的查询度量。（2017,2021年）：这项被称为“异常机构关注(AIA)”的措施 ，依赖于彭博社终端上的新闻搜索和新闻阅读。我们检查AIA指标是 否高于其他日子。

Table 7
Descriptive statistics of *sumAIA*.
This table reports descriptive statistics of daily counts of AIA (*sumAIA*) separately on LEADs and on other days. Limited by data availability, the sample period for the AIA measure covers February 2010 through December 2019. The historical data for Bloomberg's attention measure are missing from December 6, 2010 to January 7, 2011, and from August 17, 2011 to November 2, 2011.

	LEADs	Other days
Mean	116	81
Min	32	1
5 pctl	90	31
25 pctl	105	60
50 pctl	118	80
75 pctl	129	100
95 pctl	143	133
Max	160	311

5. 解释

Constrained in borrowing

- 依据Black（1972） 提出的融资受限框架
- 受杠杆限制的投资者在他们的交易策略中增持高风险资产。
- 加权过重的高风险资产由一群不受杠杆约束的投资者提供，他们在减持高风险资产的同时增持低风险资产。
- 正常非LEADs时间的净结果是高风险资产价格较高，预期回报较低（相反，低风险资产定价较低，预期回报较高）的均衡。
- 因此，我们在“正常”的非LEADs时间内观察到一个平坦的SML。

5. 解释

Market exposure and equilibrium risk premium on LEADs

- 我们提供的证据表明，股票、国债和个股投资组合的平均横截面超额回报与LEADs上的市场beta值呈正线性相关。
- 另外，我们还表明在LEADs上报告的市场回报溢价的增长与市场风险的增加相一致。

6. 结论

- **LEADs的盈余公告对企业层面（微观）股票价格具有“宏观”影响。**

谢谢大家！

请各位老师和同学们批评指正！